

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

A423.9
F764
ip.3

SEND TO STACKS

F764-127

FOREST PEST LEAFLET 33

Canker-Rots in Southern Hardwoods

F. I. McCracken and E. R. Toole¹

Canker-rot fungi cause serious de-grade and cull in southern hardwoods, especially the red oaks. Heartwood decay is the most serious form of damage. In addition, the cambium dies and the sapwood decays for as much as 3 feet above and below the entrance point into the tree. The ability of these fungi to kill the cambium and induce cankers distinguishes them from numerous others that are restricted to the heartwood. Two fungus species in the family Polyporaceae and one in the Hydnaceae are primarily responsible for canker-rots. The diseases are commonly called hispidus canker, spiculosa canker, or Irpex canker, depending on the causal fungus. They occur throughout the South and in other regions.

Importance

Canker-rots are most important on the red oaks; however, they also occur on hickory, honeylocust, some white oaks, and other hardwoods. Hispidus canker, caused by *Polyporus hispidus*, appears most frequently on willow oak and water oak

in bottom lands and occasionally on Nuttall oak, white oaks, and hickory. Spiculosa canker, caused by *Poria spiculosa*, is most common on willow oak, water oak, and honeylocust in bottom lands, and on hickory in uplands. A similar canker caused by *Poria laevigata* is found on bottom-land red oaks. Irpex canker, caused by *Irpex mollis*, most often attacks red oaks in both bottom land and upland areas.

The prevalence of these canker diseases varies by locale. In the Piedmont hardwood areas of North Carolina, South Carolina, and Georgia, hispidus cankers were found on 3.4 percent of the red oaks and 0.4 percent of the white oaks. In 2,000 acres of Mississippi bottom land, 13 percent of the willow oaks and 3 percent of the Nuttall oaks had hispidus cankers. The total loss from cankers and rot was 4 percent of the cubic volume. Cankers were lengthening at a rate of 0.5 foot per year, and the length of visible heart rot exceeded canker length by an average of 2.4 feet.

Spiculosa cankers are less common than hispidus cankers. In some areas, however, up to 10 percent of the bottom land red oaks are infected. In the Piedmont area spiculosa cankers were found on 8.1 percent of the hickories and 7.7 percent of the red oaks. The rot behind spiculosa cankers increases in length at a rate of about 10 inches per year.

The decay under Irpex cankers extends up and down from some cankers as much as 8 feet; however, the rate of decay is unknown.

¹ Plant pathologist and formerly plant pathologist, respectively, at the Southern Hardwoods Laboratory, maintained at Stoneville, Miss., by the Southern Forest Experiment Station, USDA Forest Service, in cooperation with the Mississippi Agricultural and Forestry Experiment Station and the Southern Hardwood Forest Research Group. The junior author is now assistant professor, Forest Products Utilization Laboratory, Mississippi State University, State College, Miss. 39762.

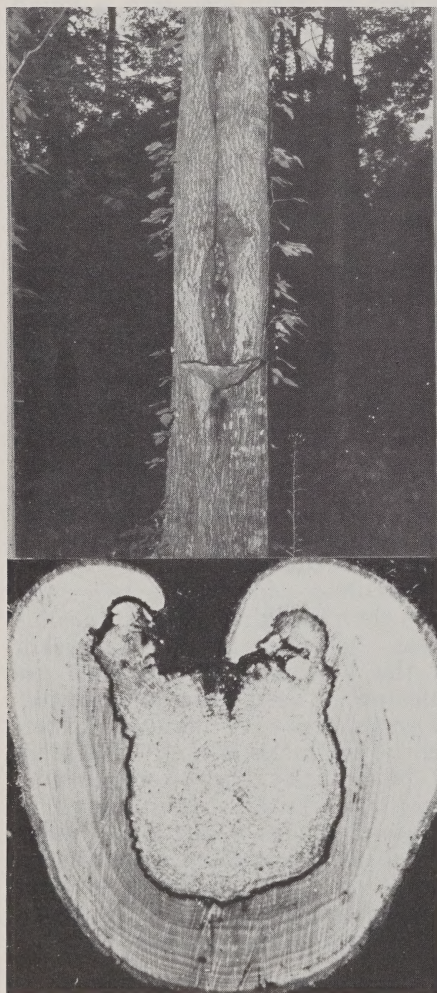
U.S. DEPARTMENT OF AGRICULTURE

Forest Service

Revised July 1974

Life History and Habits

Like most wood-rotting fungi, those causing canker diseases reproduce from microscopic spores. Spores, produced and released by conks (sporophores), are distributed by the wind. Those that lodge on wounds may germinate and start new infections. Canker-rot fungi generally enter through dead branch stubs and grow down these stubs into the heartwood. They also spread out from the point of entry, killing the cambium and forming progressively larger cankers.



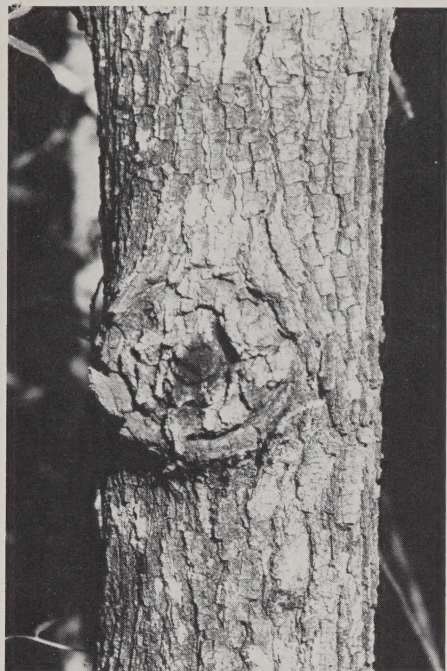
F-484326; F-484327

Figure 1.—Hispidus canker and conk on a Nuttall oak. The rotten heartwood is shown in the cross-section.

Hispidus cankers (fig. 1) are usually elongate, large, and conspicuous. When the cambium dies, a callus fold forms around it; but the callus tissue is killed in a few years by the spreading fungus. As additional callus folds are formed and killed, the tree frequently develops a spindle-shaped swelling that continues to increase in size with time. The central part of the infected region is sunken and covered with bark. The remnant of an old branch stub, usually less than 1 inch in diameter, can frequently be found near the center of the canker. On young cankers the branch stub itself is often present.

Hispidus conks are 2 to 12 or more inches wide. They are spongy, hairy, stalkless, and yellowish brown to rusty red. The lower surface has small round pores. The conks form from July to October and produce large quantities of spores daily for up to 21 days. Spores are dispersed in all directions from the conks. Most travel no more than about 140 yards, and movement is usually horizontal and downward. After a few months the conks dry to a black mass and fall to the ground. Behind the cankers the entire heartwood is decayed. The decay is called a white rot because the wood is delignified and becomes soft and straw-colored to pale yellow.

Spiculosa cankers (fig. 2) appear as rough circular swellings on the bole, usually with depressed centers. Evidence of an old branch stub generally can be found in the center of the canker, where the branch wood has been replaced by brown, sterile fungus material. Although the cankers are small, the infected branch traces are much more swollen than uninfected ones. Conks ordinarily do not grow on living infected trees; they develop on well-decayed logs or snags. They grow flat under the bark of the dead tree and, as they develop, push off the bark to expose the brown fruiting surface. Doubtful spiculosa infections can be identified by chopping into the center of the suspected branch trace. If infec-



F-522457

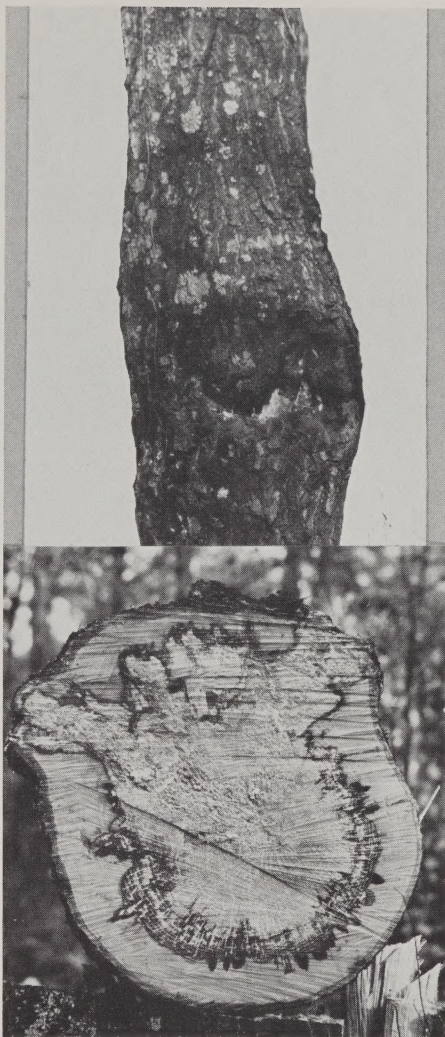
Figure 2.—*Spiculosa* canker on a young willow oak. The decayed heartwood behind *spiculosa* cankers resembles that behind *hispidus* cankers.

tion is well established, the brown fungus material will be revealed by the ax-cut. The entire heartwood behind the canker always shows white rot.

Irpex cankers (fig. 3) are more irregular in shape than the other two kinds. They usually have a branch stub at or near the center, and a number of sunken areas on the swollen margins. Conks and white fungus material often occur on or near the base of the sunken areas (fig. 4). The conks are small and creamy white with short, jagged teeth on the lower surface. Large numbers of spores are produced mostly at night for 10 days or longer during the summer. *Irpex* cankers are usually smaller than *hispidus* cankers, but some are up to 2 feet long. There is always white rot in the heartwood behind these cankers.

Control

Infections develop rapidly and



F-484329; F-484330

Figure 3.—*Irpex* canker on willow oak. The rotten heartwood is shown in the cross-section.

quickly convert trees into rotten culls. Cankered trees should be cut as soon as possible to salvage what is useable and to provide growing space for sound trees. Unmerchantable cull trees should be felled. Canker-rot fungi can produce sporulating conks on deadened standing trees for several years. Felling culls limits spore discharge in moist areas and reduces dissemination distances, thus lessening the danger of infecting branch stubs on adjacent trees.



F-484331

Figure 4.—*Irpex* conks.

References

- DEFECT IN PIEDMONT HARDWOODS. Bryan W. C. USDA Forest Serv. Southeast. Forest. Exp. Stn. Res. Notes 115, 2 p. 1958.
- A SPECIES OF *PORIA* CAUSING ROT AND CANKERS OF HICKORY AND OAK. Campbell, W. A. and Ross W. Davidson. *Mycologia* 34:17-26. 1942.
- SPOROPHORE DEVELOPMENT AND SPORULATION OF *POLYPORUS HISPIDUS*. McCracken, F.I. and E. R. Toole. *Phytopathology* 59: 884-885. 1969.
- FELLING INFECTED OAKS IN NATURAL STANDS REDUCES DISSEMINATION OF *POLYPORUS HISPIDUS*. McCracken, F.I. and E. R. Toole. *Phytopathology* 64:265-266. 1974.
- CANKERS AND DECAY OF OAK ASSOCIATED WITH *IRPEX MOLLIS*. Roth, Elmer R. *Plant Dis. Rep.* 34:347-348. 1950.
- POLYPORUS HISPIDUS* AND A CANKER OF OAKS. Sleeth, B. and C. B. Bidwell. *J. For.* 35: 778-785. 1937.
- POLYPORUS HISPIDUS* ON SOUTHERN BOTTOM LAND OAKS. Toole, E. Richard. *Phytopathology* 45:177-180. 1955.